

Other embodiments will occur to those skilled in the art and are within the following claims:

What is claimed is:

Applicant: Senecal et al.
For: Conductive (electrical ionic, and photoelectric) Polymer Membrane Articles, and
Method for Producing Same

1 1. A conductive (electrical, ionic, and photoelectric) polymer membrane article,
2 comprising:

3 a non-woven membrane of polymer fibers, wherein at least some of the fibers
4 have diameters of less than one micron;

5 wherein the membrane has an electrical conductivity of at least about 10^{-6} S/cm.

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7 2. The conductive polymer membrane of claim 1 wherein the membrane is
8 photoelectric.

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10 3. The conductive polymer membrane of claim 2 wherein the membrane produces a
11 current of at least about nanoamps/cm².

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13 4. The conductive polymer membrane of claim 2 wherein the polymer fibers include
14 a photo-reactive dye.

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16 5. The conductive polymer membrane of claim 4 wherein the polymer fibers further
17 include conducting nanoparticles embedded therein.

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19 6. The conductive polymer membrane of claim 4 wherein the polymer fibers further
20 include a conducting polymer.

22 7. The conductive polymer membrane of claim 1 wherein the conductivity is created
23 by the inclusion of a conducting polymer in the polymer fibers.

24
25 8. The conductive polymer membrane of claim 1 wherein the conductivity is created
26 by the inclusion of conducting nanoparticles embedded in the membrane polymer fibers.

27
28 9. A method of fabricating a conductive polymer membrane article, comprising:
29 providing a polymer solution;
30 adding to the polymer solution at least one of a conductive polymer and conducting
31 nanoparticles to create a spin dope; and
32 electrostatically spinning the spin dope to create a membrane of conductive polymer
33 fibers having an electrical conductivity of at least about 10^{-6} S/cm.

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35 10. The method of claim 9 wherein the membrane is photoelectric.

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37 11. The method of claim 10 wherein the membrane produces current of at least about
38 nanoamps/cm².

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40 12. The method of claim 10 wherein a photo-reactive compound is also added to the
41 polymer solution before it is spun.

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43 13. The method of claim 12 wherein conducting nanoparticles are in the spin dope
44 and embedded in the polymer fibers.

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46 14. The method of claim 12 wherein a conductive polymer is in the spin dope and in
47 the polymer fibers.

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49 15. The method of claim 9 wherein conducting nanoparticles are in the spin dope and
50 embedded in the polymer fibers.

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52 16. The method of claim 9 wherein a conductive polymer is the spin dope and in the
53 polymer fibers.